

**GEOCHEMICAL CHARACTERIZATION - BRITSOL BAY DRAINAGES**

**TABLE 11-46**

**Results from Static Tests on Representative Tailings Samples, First Three Rounds**

Sample ID	Product	Paste pH (Std. Units)	Total S (%)
<b>July 2004 Set</b>			
1st Bulk Cl, Sc, TLS F66	Non-pyritic tails	7.8	0.1
1st Bulk Cl, Sc, TLS F67	Non-pyritic tails	7.8	0.1
1st Bulk Cl, Sc, TLS F68	Non-pyritic tails	7.9	0.1
1st Bulk Cl, Sc, TLS F69	Non-pyritic tails	7.7	0.1
Knelson TLS F66	Knelson TLS	8.0	0.1
Knelson TLS F67	Knelson TLS	8.2	0.1
Knelson TLS F68	Knelson TLS	8.1	0.1
Knelson TLS F69	Knelson TLS	8.0	0.1
RE 1st Bulk Cl, Sc, TLS F66	Non-pyritic tails	7.8	-
RE Knelson TLS F69	Knelson TLS	8.0	-
<b>January 2005 Set</b>			
Feed 1 Scavenger Tails	Scavenger	8.8	0.15
Feed 1 Bulk Cleaner Tails	Bulk Cleaner	8.8	0.23
Feed 1 Scavenger Tails + Bulk Cleaner Tails	Non-pyritic tails	8.5	0.18
Feed 2 Scavenger Tails	Scavenger	8.6	0.17
Feed 2 Bulk Cleaner Tails	Bulk Cleaner	8.3	0.31
Feed 2 Scavenger + Bulk Cleaner Tails	Non-pyritic tails	8.9	0.18
<b>November 2005 Set</b>			
LT C1 Combined Rougher Tailings	Rougher	8.5	0.16
LT C1 Combined Pre-Cleaner Tailings	Pre-cleaner	7.8	1.82
LT C1 Calculated	Non-pyritic tails	-	0.29
LT C2 Combined Rougher Tailings	Rougher	8.6	0.09
LT C2 Combined Pre-Cleaner Tailings	Pre-cleaner	8.1	1.72
LT C2 Calculated	Non-pyritic tails	-	0.21
LT C3 Combined Rougher Tailings	Rougher	8.7	0.17
LT C3 Combined Pre-Cleaner Tailings	Pre-cleaner	7.5	3.61
LT C3 Calculated	Non-pyritic tails	-	0.43
LT C4 Combined Rougher Tailings	Rougher	8.8	0.24
LT C4 Combined Pre-Cleaner Tailings	Pre-cleaner	7.9	4.19
LT C4 Calculated	Non-pyritic tails	-	0.54

## ds of Metallurgical Testing, Pebble West Zone

Sulfate (%)	Sulfide (%)	AP (kg CaCO <sub>3</sub> /t)	Fizz Rating (Unity)	NP <sub>Modified</sub> (kg CaCO <sub>3</sub> /t)	TIC (%)	TIC (kg CaCO <sub>3</sub> /t)
0.0	0.1	2.2	Strong	11.6	-	-
0.1	0.1	2.8	Strong	11.3	-	-
0.0	0.1	3.4	Strong	12.0	-	-
0.0	0.1	3.1	Strong	8.1	-	-
0.0	0.1	2.5	Strong	7.9	-	-
0.0	0.1	4.1	Strong	9.8	-	-
0.0	0.1	3.1	Strong	10.4	-	-
0.0	0.1	2.5	Strong	6.5	-	-
-	-	-	Strong	11.8	-	-
-	-	-	Strong	6.8	-	-
-0.01	0.15	4.7	None	19.9	0.35	29.2
0.01	0.22	6.9	None	19.6	0.36	30.0
0.01	0.17	5.3	None	17.4	0.34	28.3
-0.01	0.17	5.3	None	24.4	0.48	40.0
-0.01	0.31	9.7	None	23.3	0.46	38.3
0.02	0.16	5.0	None	25.9	0.49	40.8
0.02	0.14	4.4	None	14.8	0.3	25.0
0.09	1.73	54.1	None	16.1	0.34	28.3
0.03	0.26	8.16	None	14.90	0.30	25.25
0.01	0.08	2.5	None	16.9	0.53	44.2
0.03	1.69	52.8	None	21.8	0.75	62.5
0.01	0.20	6.33	None	17.27	0.55	45.56
0.01	0.16	5.0	None	17.2	0.46	38.3
0.09	3.52	110.0	None	12.5	0.45	37.5
0.02	0.42	12.99	None	16.84	0.46	38.27
-0.01	0.24	7.5	None	24.9	0.41	34.2
0.07	4.12	128.8	None	18.6	0.32	26.7
0.00	0.54	16.73	None	24.42	0.40	33.60

NP/AP (ratio)	24 hr pH	Ag (mg/kg)	As (mg/kg)	Cd (mg/kg)	Co (mg/kg)	Cr (mg/kg)	Cu (mg/kg)	Hg (mg/kg)
5.3	-	0.66	15	0.24	4	273	995	0.56
4.0	-	0.68	15	0.28	4.2	276	693	0.5
3.5	-	0.76	12	0.08	7.1	271	461	0.36
2.6	-	0.69	12	0.13	8.4	196	632	0.35
3.2	-	0.39	12	0.07	2.4	160	652	0.18
2.4	-	0.51	14	0.18	2.7	166	564	0.1
3.3	-	0.38	11	0.03	5.2	163	338	0.18
2.6	-	0.37	9	0.06	6.1	135	403	0.19
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
4.2	1.76	0.49	20	0.15	4.4	69	853	0.02
2.9	1.85	0.82	29	0.25	5.5	68	1,265	0.03
3.3	1.87	0.52	20	0.15	4.5	59	889	0.02
4.6	1.80	0.42	19	0.11	4.8	58	575	0.02
2.4	1.78	0.84	29	0.19	6.3	54	998	0.04
5.2	1.86	0.52	20	0.18	5.4	61	636	0.03
3.4	1.58	0.47	14.8	0.06	4.3	112	380	0.02
0.3	1.78	2.17	50.8	0.17	28.4	451	1,560	0.08
1.8	-	0.6	18	0.07	6.13	137.79	470	0.02
6.8	1.83	0.28	8.8	0.13	5.3	87	288	0.09
0.4	1.87	2.04	45.9	0.4	33.6	670	2,050	0.06
2.7	-	0.41	12	0.15	7.45	131.36	422	0.09
3.4	1.80	0.26	27.2	0.09	4	85	241	0.04
0.1	1.77	2.12	169	0.24	45.9	748	1,585	0.19
1.3	-	0.4	38	0.10	7.19	135.45	343	0.05
3.3	1.81	0.27	13.2	0.07	3.8	77	261	0.03
0.1	1.76	1.3	57.9	0.11	39	598	853	0.1
1.5	-	0.35	17	0.07	6.48	116.64	306	0.04

Mn (mg/kg)	Mo (mg/kg)	Ni (mg/kg)	Pb (mg/kg)	Sb (mg/kg)	Se (mg/kg)	Tl (mg/kg)	Zn (mg/kg)
316	53	142.5	33.8	0.86	1	0.11	44
492	31	148	88.4	0.61	0.7	0.19	42
463	47	136	17.2	1.1	0.8	0.35	45
571	41	98.5	7.8	0.79	0.8	0.33	58
238	52	66.9	19.1	0.67	0.7	0.07	30
390	29	74.9	58	0.58	0.5	0.15	32
378	36	71.2	8.8	0.74	0.6	0.31	33
490	38	57.4	4.8	0.49	0.6	0.25	43
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
348	92	12.7	11.5	1.16	1.3	0.33	38
394	45	15.9	17.7	1.67	1.4	0.41	47
351	40	13.7	12.6	1.18	1.2	0.33	38
398	60	14.7	8.6	1.02	1	0.29	37
455	57	20.5	13.7	1.53	1.6	0.35	45
417	55	16.7	10.2	1.05	1.3	0.36	43
340	41.6	16.2	14.6	2	1.8	0.34	29
491	101	255	37.2	5.41	7.4	0.52	52
351.49	46	34.37	16.32	2.26	2.2	0.35	31
406	44.6	13.4	6.8	0.39	1	0.23	44
689	188	395	34.9	1.82	6.3	0.33	97
427.53	55	42.43	8.94	0.5	1.4	0.24	48
641	27.2	11.9	6.1	0.61	0.8	0.45	39
880	153	452	25.5	3.12	8.8	1.2	73
659.18	37	45.39	7.58	0.8	1.4	0.51	42
492	21.4	12.2	4.6	0.39	0.7	0.49	39
554	87.9	363	14.1	1.2	7.3	0.85	48
496.72	26	38.89	5.32	0.45	1.2	0.52	40

**GEOCHEMICAL CHARACTERIZATION - BRITSOL BAY DRAINAGES**

**TABLE 11-47**

**Results from Static Tests on Representative Tailings Samples, Metallurgical Testir**

Sample ID	Paste pH	C (T) (%)	CO <sub>2</sub> (%)	TIC (CaCO <sub>3</sub> )	S (T) (%)	S (SO <sub>4</sub> ) (%)	S (S-2) (%)	AP (CaCO <sub>3</sub> )
<b>Pebble West Zone</b>								
11840-003 bulk cleaner	7.95	0.45	1.1	25.0	0.78	0.03	0.75	23.4
11840-003 pyrite (Fig2)	6.60	0.52	1.3	29.5	1.44	0.2	1.24	38.8
11840-003 bulk float (Fig2)	7.92	0.52	1.1	25.0	0.17	0.03	0.14	4.4
11840-003 Phase II sands	8.55	0.37	1	22.7	0.26	0.01	0.25	7.8
11840-003 Phase II OF	8.33	0.48	1.1	25.0	0.1	0.01	0.09	2.8
<b>Pebble East Zone</b>								
PP08-3365	7.95	0.06	0.2	4.55	0.23	0.02	0.21	6.56
PP08-3607	8.11	0.07	0.3	6.82	0.17	0.02	0.15	4.69
PP08-3610	7.99	0.08	0.2	4.55	0.09	0.04	0.05	1.56
PP08-3614	8.18	0.1	0.3	6.82	0.11	0.02	0.09	2.81
PP08-3849	8.45	0.06	0.2	4.55	0.11	0.01	0.1	3.13
PP08-3850	8.58	0.05	0.2	4.55	0.29	0.02	0.27	8.44
11486-003	7.93	0.07	0.3	6.8	0.15	0.04	0.11	3.4
11486-005	7.89	0.08	0.3	6.8	0.16	0.05	0.11	3.4
11480-006	8.57	0.06	0.3	6.8	0.17	0.02	0.15	4.7
11846-003 bulk	8.41	0.06	0.3	6.8	0.12	0.01	0.11	3.4
11846-003 OF	7.85	0.07	0.3	6.8	0.17	0.06	0.11	3.4
11846-003 UF	8.72	0.05	0.2	4.5	0.21	0.01	0.2	6.3

**g during 2008, Pebble West and East Zones**

<b>NP (CaCO<sub>3</sub>)</b>	<b>Net NP</b>	<b>NP/AP (ratio)</b>	<b>Fizz Test (visual)</b>	<b>Ag (mg/kg)</b>	<b>Al (%)</b>	<b>As (mg/kg)</b>	<b>Au (mg/kg)</b>	<b>B (mg/kg)</b>
17.7	-5.7	0.8	Slight	1.05	1.42	46.4	<0.2	<10
23.0	-15.8	0.6	Slight	1.46	1.27	63.2	0.2	<10
22.3	17.9	5.4	Slight	0.33	1.29	12.6	<10	<10
21.1	13.3	2.7	Slight	0.29	0.97	15.9	<0.2	<10
25.2	22.4	9.0	Slight	0.28	1.44	8.8	<0.2	<10
4.6	-2.0	0.7	None	0.57	0.93	7.4	< 0.2	< 10
5.7	1.0	1.2	None	0.75	1.1	9.1	< 0.2	< 10
6.3	4.7	4.0	None	0.44	0.48	6.4	< 0.2	< 10
5.7	2.9	2.0	None	0.3	0.33	4.2	< 0.2	< 10
6.2	3.1	2.0	None	0.23	0.44	4.2	< 0.2	< 10
6.3	-2.1	0.7	None	0.45	0.96	9	< 0.2	< 10
6.2	2.8	1.8	Slight	0.38	0.51	14	< 0.2	< 10
6.7	3.3	1.9	None	0.57	0.72	12	< 0.2	< 10
6.2	1.5	1.3	Slight	0.28	0.54	113	< 0.2	< 10
7.2	3.8	2.1	Slight	0.29	0.64	5.5	< 0.2	< 10
8.3	4.9	2.4	None	0.55	0.73	12.6	< 0.2	< 10
7.0	0.8	1.1	Slight	0.26	0.47	12.2	< 0.2	< 10

<b>Ba</b> <b>(mg/kg)</b>	<b>Be</b> <b>(mg/kg)</b>	<b>Bi</b> <b>(mg/kg)</b>	<b>Ca</b> <b>(%)</b>	<b>Cd</b> <b>(mg/kg)</b>	<b>Ce</b> <b>(mg/kg)</b>	<b>Co</b> <b>(mg/kg)</b>	<b>Cr</b> <b>(mg/kg)</b>	<b>Cs</b> <b>(mg/kg)</b>
40	0.64	0.7	0.85	0.31	30.7	8.2	43	4.91
40	0.53	1.03	1.06	0.19	31.2	12.7	130	4.06
50	0.56	0.2	1.1	0.13	28.7	4.4	53	4.02
40	0.34	0.25	0.8	0.16	17.7	3.4	71	2.51
50	0.56	0.44	1.07	0.1	29.1	4	46	4.28
20	0.24	0.26	0.28	0.12	16.1	4.8	33	2.46
20	0.29	0.76	0.3	0.11	19.75	5.1	38	2.92
30	0.23	0.86	0.35	0.09	11.25	3.5	11	1.64
20	0.2	0.28	0.29	0.08	7.97	2.5	6	1.22
30	0.18	0.76	0.27	0.1	7.22	2.2	141	0.84
20	0.26	0.41	0.25	0.1	15.4	5.3	108	1.75
20	0.29	0.31	0.29	0.13	11.15	3.6	24	1.49
30	0.34	1.3	0.35	0.11	15.6	4.8	34	1.89
20	0.22	0.35	0.26	0.12	9.55	2.9	101	0.93
30	0.25	0.26	0.34	0.09	13.45	3	45	1.47
30	0.33	1.98	0.35	0.13	18.15	5.1	48	2.15
20	0.19	0.5	0.25	0.15	9.89	3.3	78	0.88

Cu (mg/kg)	Fe (mg/kg)	Ga (mg/kg)	Ge (mg/kg)	Hf (mg/kg)	Hg (mg/kg)	In (mg/kg)	K (%)	La (mg/kg)
1180	3.07	6.68	0.09	0.07	0.1	0.03	0.7	15.2
506	3.97	5.26	0.1	0.08	0.08	0.032	0.67	15.1
312	2.8	5.53	0.09	0.06	0.03	0.019	0.73	13.7
476	2.15	4.47	0.06	0.06	0.04	0.014	0.61	9.1
142	2.65	6.03	0.06	0.07	0.03	0.017	0.72	15
967	1.32	4.21	0.06	0.02	< 0.01	0.015	0.43	7.5
788	1.44	5.19	0.06	0.02	0.01	0.016	0.51	9.3
308	0.85	2.01	< 0.05	0.02	< 0.01	0.014	0.17	5.7
323	0.59	1.39	< 0.05	0.02	< 0.01	0.01	0.11	3.9
414	0.57	1.64	< 0.05	0.02	< 0.01	0.009	0.19	3.6
1040	1.18	4.6	0.05	0.03	< 0.01	0.022	0.5	7.3
512	0.8	2.29	0.05	0.02	< 0.01	0.011	0.19	5.4
465	1.1	3.1	0.06	0.02	0.01	0.012	0.26	7.5
577	0.68	2.12	0.05	0.02	0.01	0.009	0.24	4.6
435	0.85	2.57	< 0.05	0.02	0.01	0.009	0.28	6.8
483	1.2	3.19	< 0.05	0.02	0.06	0.017	0.31	9.1
532	0.67	1.89	< 0.05	0.02	0.01	0.01	0.23	4.9

Li (mg/kg)	Mg (mg/kg)	Mn (mg/kg)	Mo (mg/kg)	Na (%)	Nb (mg/kg)	Ni (mg/kg)	P (mg/kg)	Pb (mg/kg)
7.3	1	474	65.2	0.05	0.14	22.1	850	14.8
7.2	0.92	607	25.4	0.04	0.18	27.8	890	16.3
7.5	1.05	532	24.8	0.05	0.14	13.7	1,350	3.7
4.5	0.8	394	41.7	0.03	0.14	11.3	870	3.3
6.7	1.05	520	10.5	0.03	0.13	14.1	1,320	3.7
14.9	0.8	113	59.1	0.01	0.13	20.1	290	3.9
18.4	0.91	127	55	0.01	0.2	23.5	340	5.6
6.1	0.28	126	21	0.01	0.11	8.5	320	12.6
4.7	0.19	97	14.2	0.01	0.11	6.6	270	7.5
4.4	0.17	97	21.7	0.01	0.13	6.3	240	4.3
15.8	0.7	95	70.1	0.01	0.13	20.6	260	3.7
9.6	0.31	103	31.7	0.01	0.14	8.7	270	7.9
10.8	0.42	131	33.3	0.01	0.17	12.2	310	13.2
7	0.26	93	57.9	0.01	0.11	7.8	260	5.1
7.8	0.37	116	36.8	0.01	0.12	9.3	290	3.6
9.5	0.44	133	34.5	0.01	0.17	13.6	310	13.5
5.3	0.24	84	78.6	0.01	0.11	7.1	230	6.5

<b>Rb</b> <b>(mg/kg)</b>	<b>Re</b> <b>(mg/kg)</b>	<b>S</b> <b>(%)</b>	<b>Sb</b> <b>(mg/kg)</b>	<b>Sc</b> <b>(mg/kg)</b>	<b>Se</b> <b>(mg/kg)</b>	<b>Sn</b> <b>(mg/kg)</b>	<b>Sr</b> <b>(mg/kg)</b>	<b>Ta</b> <b>(mg/kg)</b>
45	0.154	0.8	1.52	11.5	2.3	1.1	104	<0.01
36	0.049	1.45	2.06	9.2	3.1	1.7	72.8	<0.01
39.4	0.045	0.22	0.64	10.5	0.7	0.8	82.1	<0.01
37.9	0.086	0.26	0.79	8.5	0.8	0.5	41.8	<0.01
45.3	0.022	0.1	0.41	11.1	0.4	0.8	80.6	<0.01
22.4	0.104	0.24	0.33	6.6	1.6	0.6	56.2	<0.01
25.9	0.096	0.17	0.4	7.8	1.3	0.9	61	<0.01
8.4	0.036	0.1	0.37	1.9	0.8	0.7	73.5	<0.01
5.6	0.025	0.09	0.27	1.3	0.7	0.4	61.5	<0.01
7.8	0.03	0.1	0.2	1.4	0.8	0.2	45.3	<0.01
30.1	0.111	0.29	0.29	7	1.7	0.5	46.5	<0.01
11	0.057	0.18	0.39	2.9	1.1	0.5	53	<0.01
12.4	0.057	0.19	0.51	3.5	1.6	0.8	67.7	<0.01
11.5	0.093	0.21	0.34	2.4	1.3	0.3	39.8	<0.01
15.1	0.058	0.11	0.53	3.1	0.8	0.4	55.6	<0.01
18.6	0.06	0.17	0.55	3.8	1.4	0.9	66.8	<0.01
11.8	0.133	0.19	0.35	2.2	1.1	0.3	37	<0.01

Te (mg/kg)	Th (mg/kg)	Ti (mg/kg)	Tl (mg/kg)	U (mg/kg)	V (mg/kg)	W (mg/kg)	Y (mg/kg)	Zn (mg/kg)
0.46	2.6	0.075	0.49	0.74	118	0.68	11.6	238
0.92	2.6	0.072	0.55	0.87	121	1.06	10.5	191
0.12	2.2	0.097	0.37	0.67	124	0.5	13.35	138
0.14	1.6	0.082	0.32	0.43	96	8.07	9.39	51
0.12	2.3	0.09	0.34	0.69	123	2.78	14.05	149
0.1	1.8	0.066	0.25	0.26	123	0.39	7.89	125
0.1	2.2	0.071	0.27	0.29	149	0.44	8.78	155
0.14	1.4	0.01	0.16	0.28	56	0.73	6.02	146
0.08	1	0.009	0.11	0.2	36	0.91	4.86	90
0.06	1	0.01	0.13	0.19	38	0.74	4.24	53
0.08	1.9	0.066	0.31	0.24	112	0.83	7.63	96
0.12	1.2	0.02	0.14	0.21	57	0.8	5.16	158
0.21	1.6	0.021	0.2	0.27	81	0.79	6.48	267
0.08	1	0.019	0.17	0.17	51	0.82	4.49	74
0.11	1.3	0.024	0.15	0.22	68	1.15	5.67	149
0.32	1.7	0.021	0.21	0.31	84	29.8	7.48	260
0.08	1	0.017	0.14	0.17	47	3.23	4.58	71

Zr (mg/kg)
2.7
2.4
2
1.4
2
<0.5
0.5
<0.5
<0.5
0.5
0.6
0.5
0.5
<0.5
<0.5
0.6
<0.5